



# platform solutions

on-line news for the hardware developer

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## Feature Story

Each month we'll provide a feature article on key industry trends and developments. Authored by a member of Intel's Executive Staff, you'll find insightful and useful information for product development, planning and execution.

## Top News Stories

Delivering an in-depth report on key platforms, products and technologies, our Top Stories provide a monthly source of information on the issues affecting hardware developers. Be sure to check in every month for the latest stories that are driving the evolution of the industry.

## Platform News and Information

Every month we cover the latest developments in platform initiatives and technologies. Our "Platforms" pages provide news on the latest trends and initiatives for the business, home, mobile, server and workstation platforms. Our "Industry Events" page keeps you up to date on upcoming industry gatherings targeted at the platform and peripheral developer, including the new Intel Developer Forum.

## Technology News

Our "Technologies" pages give you quick and detailed information on the industry status of specific platform technologies, from the emergence of the Accelerated Graphics Port (AGP) to the latest advances in Intel microprocessors, memory, Audio, USB, 1394, DVD, Power Management, and PC 98/99. This department is your source for the hottest technology and product announcements, white papers, design guides, specifications, tools and developer events available to the industry.

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***On behalf of all of us at Platform Solutions, welcome to the future of the PC platform!***

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## **Feature**

### ***Technology and Innovation Fueling Mobile Market Growth***

By Stephen Nachtsheim  
Corporate Vice President and General Manager  
Mobile & Handheld Products Group, Intel Corporation

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If you have glanced at industry sales charts lately, there is no doubt sales of mobile PCs are rapidly moving upward. According to figures released by Dataquest (April 1998), the mobile PC category continues to represent the PC industry's fastest-growing market segment. Several factors are converging to fuel this dramatic growth—including the trend toward “desktop” performance at low price points.

#### **Now Arriving: New Mobile PC Segments**

Like the desktop market, the mobile PC space is clearly beginning to segment. One emerging market segment is called the “mini-notebook,” a mobile PC equipped with a low-power Pentium® processor with MMX™ technology. Mini-notebook systems weigh-in under three pounds, incorporate a scaled-down keyboard and LCD screen and have external peripherals like a floppy drive or CD-ROM. Fast-moving business executives and other “on-the-go” PC users purchase mini-notebooks primarily for e-mail, Web access and calendar applications. These compact but highly capable systems deliver full PC capability in a range of unique form factors, some as small as a VHS video cassette, and some are becoming available at price points under \$1,500.

Another emerging segment is the “basic mobile PC,” a complete mobile PC in a conventional form factor that provides baseline performance for standard business applications. Also based on the current low-end Intel® processor (today it's the mobile Pentium processor with MMX technology at 166 MHz or greater), these systems generally include an internal floppy drive, CD-ROM and a standard-size keyboard. Aggressive pricing of microprocessors by Intel, as well as declining costs for LCD screens and other platform components, are helping drive the cost of these systems down to unprecedented levels, many now becoming available at prices under \$1,699.

#### **Desktop Performance—At Lower Power**

While the segmentation noted above portends a continued robust market, the bulk of the mobile PCs sold today fall into the “mainstream desktop replacement” segment. Most of today's mobile PC users expect desktop PC performance in a mobile platform. Simply put, mobile users do not want inferior capabilities when they are on the road, away from their desks. Introduced in April 1998, the mobile Pentium II processor at 266 MHz meets that expectation. This powerful processor delivers the performance needed to run today's most sophisticated business software, such as data mining, 3D Web browsing, integrated calendar and mail software, and other client-centric remote applications. It also provides ample headroom needed for “next-generation” 32-bit operating systems, including Windows NT\* and Windows\* 98.

The unique combination of leading-edge performance, wide range of form factors, and mainstream system price points offered by Pentium II processor-based mobile PCs has the potential to trigger the fastest mobile processor ramp in history. We now expect that by the end of 1998, mobile Pentium II processors will account for more than 50 percent of all Intel® mobile microprocessor shipments. We also expect them to begin appearing in mini-notebook and basic mobile PC platforms in the first half of 1999.

#### **Intel Puts Good Things in Small Packages**

Implementing desktop PC performance in a small, lightweight, battery-operated mobile PC requires meeting the serious technical constraints of power consumption, thermal cooling and limited space. Intel is playing a leading role by providing the mobile industry with the necessary platform building blocks—including processors, chipsets and graphics solutions—and innovative mobile system architecture and design technologies.

Intel is also the driving force behind technology initiatives that will enable the industry to advance the mobile PC platform even further in the months ahead. For example, Intel is leading the industry-wide Mobile Power Initiative to help developers implement more mobile-friendly products, from peripheral devices and application software to the mobile PC platform itself. Intel is also behind efforts to lower the Total Cost of Ownership (TCO) of mobile PCs through the Advanced Configuration and Power Interface (ACPI) and the Wired for Management (WfM) initiatives. In addition, the Mobile Data Initiative promotes the use of mobile PCs with wireless data communications, and seeks to enable anywhere, anytime computing and communications.

The mobile PC industry is going places, and Intel is helping to make it happen. Mobile Pentium II processors, other platform building blocks, and mobile technology initiatives are driving awesome performance in small form factors at affordable prices. This will help move mobile PC sales to new heights in 1998 and beyond.

#### **About the Author**

Stephen Nachtsheim is Corporate Vice President and General Manager of Intel's Mobile and Handheld Products Group (MHPG). MHPG's mission is to help grow the PC market by increasing the capability of mobile PCs in all sizes, weights, and at all price points.

#### **For more Information**

To learn more about what the Pentium II processor means for mobile PCs, read the Q&A with Frank Spindler, Intel's Director of Mobile Marketing in this month's issue of *Platform Solutions*.

<http://developer.intel.com/solutions/issue/stories/top1.htm>

For more information about the Mobile Power Initiative, see the Top Story by Rusty Schafer, Intel Strategic Platform Marketing Manager.

<http://developer.intel.com/solutions/issue/stories/top2.htm>

For an update on Mobile Manageability, read the Top Story by Naveen Musinipally, Intel's Mobile WfM Program Manager.

<http://developer.intel.com/solutions/issue/stories/top3.htm>

To get the latest on the Mini-Notebook trend in mobile PC design, check out the Top Story by Terran Reneau and Dave Kaufman, Intel's Mobile Platform Marketing Program Managers.

<http://developer.intel.com/solutions/issue/stories/top4.htm>

## **Top Stories**

### ***Meeting the Needs of the Mobile PC Industry: An Interview with Intel's Director of Mobile Marketing***

Q&A with Frank Spindler, Director of Marketing  
Mobile & Handheld Products Group, Intel Corporation

*Intel's role in the mobile PC industry has evolved dramatically over the years. In the past, Intel would take processors that were developed for desktop computer systems and try to find ways to fit them into mobile PCs. Today, Intel is much more focused on mobile needs from the beginning of the development process of a new mobile processor. Platform Solutions News recently caught up with Frank Spindler, director of marketing for Intel's Mobile & Handheld Products Group, to expand on Intel's leadership role in the mobile PC industry. Here are some excerpts from that conversation.*

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#### **Q. Intel recently introduced the Intel® Mobile Pentium® II processor at speeds of 233 and 266 MHz. What does the Mobile Pentium II processor bring to mobile PCs?**

**A.** The most significant aspect of the Intel Mobile Pentium II processor introduction is that mobile PC users now have access to the performance of Intel's most advanced processor generation. This truly brings the performance of desktop systems to mobile platforms. The Mobile Pentium II processor provides all the key benefits of the Intel Pentium II processor, and it does all this in a much smaller and lighter package that consumes less power. You're compromising very little today when you purchase a mobile PC with a state-of-the-art Mobile Pentium II processor compared to a high-end desktop system.

In the development of the Mobile Pentium II processor, Intel took significant engineering steps to ensure that factors such as power consumption, size, and weight of the processor were ideal for mobile platforms. This engineering effort allows mobile PC OEMs to quickly and cost-effectively bring the performance of the Pentium II processor to mobile PCs.

The Mobile Pentium II processor is also moving into the mobile PC market segment at mainstream price points. In the past, mobile PCs with new processors were introduced at prices of \$5,000 and above, but today we're seeing mobile platforms with the Mobile Pentium II processor at prices of \$3,000 and below in a variety of shapes and sizes. This further illustrates how Mobile Pentium II processor technology moves into existing mobile platform technologies extremely well.

#### **Q. Intel designs mobile processors, but it plays a bigger role in the mobile PC industry. Describe that role, and how it has changed over years?**

**A.** It is very important to Intel for our new processor technologies to be integrated smoothly into customer products. We think that the Mobile Pentium II processor does not require drastic new system technologies to be developed by OEMs. For example, we have maintained a thermal limit on all of our processors of 8 watts for the processor core, beginning with the fastest Mobile Pentium processors and continuing through to the Mobile Pentium II. Because of this, our customers are able to use well-established, cost-effective thermal technologies when building Mobile Pentium II notebooks.

Intel's role in the mobile PC industry has evolved dramatically over the years. In the early days, we'd take processors that were developed for desktop systems and try to find ways to fit them into mobile PCs. Today, we are much more focused on mobile needs from the beginning of the development of a new mobile processor. Last year, we introduced versions of the Intel Mobile Pentium processor with MMX™ technology based on .25-micron process technology, marking the first time that Intel's most advanced process technology was first used for mobile. Bringing new process technology to mobile first is a big benefit that not only provides higher performance, but also less power consumption benefits, and we will continue to use this approach as the mobile market segment grows.

**Q. It's also important for Intel to be a leader in mobile PC industry initiatives. Describe what Intel is pioneering in this area.**

**A.** Intel has led a number of initiatives geared toward making mobile PCs better systems for users. To help reduce overall cost of PC ownership, we are driving the Wired for Manageability Initiative (WfM) for mobile PCs as part of Intel's overall WfM initiative. Intel's Mobile Power Initiative is designed to continue to provide mobile users with ever-increasing performance and features in a power-efficient system. We launched this initiative in September 1997 to focus on three vectors: overall platform component power, system software support, and applications software. In addition, Intel's Mobile Data Initiative is geared toward improving wireless communications on mobile PCs.

**Q. How has Intel's manufacturing process technology assisted its mobile efforts?**

**A.** In addition to what we've already discussed, the .25-micron process technology utilized by the new Mobile Pentium II processor allows us to increase operating frequency and improve performance, while significantly reducing power consumption. Intel's .25-micron process technology builds circuits down to the width of 1/400th of a piece of human hair, so we're bringing the most advanced processor generation and performance to the platform while using less power and space. All of this leads to a more powerful, cost-effective system.

We've also made advances with the introduction of mobile module technology. First introduced in February 1997, a mobile module integrates the processor, the second-level cache, and the "northbridge" of a chipset onto a single module. The major benefit of the mobile module is enabling a rapid transition from one processor generation to another, which allows OEMs to bring new systems to market quickly and efficiently. The mobile modules also help remove elements of design complexity for OEMs, and allow them to focus on designing value-add features that have yet to be brought to mobile PCs.

**Q. How does Intel view the different market segments in the mobile PC industry?**

**A.** As the mobile industry has evolved over the years, we've gone from a couple of large systems to smaller, lighter systems that are full-featured like super-notebooks and mainstream notebooks. Super-notebooks are desktop-equivalent systems that include features such as the Mobile Pentium II processor, DVD-ROM drives, and 13- to 14-inch screens. The mainstream notebook has evolved into a system that is typically 5 to 6 pounds with a 12- to 13-inch screen and a variety of peripheral options, including bays for swapping out CD-ROMs, floppies, and extra batteries. A category of thinner, lighter notebooks has emerged, but they are still full-featured. Finally, a growing category is the more basic mobile PC, which is priced below \$1,699 and features the all-in-one capability of a CD-ROM, floppy and hard drive, and a 12-inch screen.

The final category is mini-notebooks. These are extremely lightweight systems featuring the ultimate in portability while providing full access to the entire PC operating system and application software base. Mini-notebooks will be the perfect second computer for the active business professional who has a desktop computer, but needs a lightweight, fully functional mobile PC to take to meetings or for that next business trip. We've also seen growth in handheld devices that act as auxiliary devices to PCs, the most popular of those being the palm organizer.

**Q. What does the future hold for mobile PCs?**

**A.** We will see ever increasing performance in mobile PCs, and Intel will continue to strive to provide mobile users with "no compromise" computing: no compromise in performance, no compromise in features, and no compromise in the portable functionality of the system. Intel will continue to work with the mobile industry to improve wireless communications and apply advanced processor technology to deliver more performance for less power.

**About the Author**

Frank Spindler is Marketing Director of Intel's Mobile & Handheld Products Group (MHPG). He is responsible for marketing Intel's complete line of mobile processors, platforms and technologies.

**For more Information**

For more information about Intel's Mobile Power Initiative, see the Top Story by Rusty Schafer, Intel Strategic Platform Marketing Manager.

<http://developer.intel.com/solutions/issue/stories/top2.htm>

For an update on Mobile Manageability, read the Top Story by Naveen Musinipally, Intel's Mobile WfM Program Manager.

<http://developer.intel.com/solutions/issue/stories/top3.htm>

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<http://developer.intel.com/solutions/issue/stories/top4.htm>

For the latest news on Mobile Platforms and technologies, visit the Mobile Platform page in *Platform Solutions* on a regular basis.

<http://developer.intel.com/solutions/platfms/mobile.htm>

## Empowering Performance with the Mobile Power Initiative

By Rusty Schafer  
Strategic Platform Marketing Manager  
Mobile & Handheld Products Group, Intel Corporation

In the PC industry the words "performance" and "power" are often used in an interchangeable way, but these words can have different meanings in mobile PC system development. Mobile PC developers are challenged with meeting user demand for more computing "performance," compelling features, and reasonable battery life while adhering to the thermal "power" design limits of smaller form factor devices. It is easy to imagine how delivering desktop performance and features in a three pound mini-notebook PC pushes the envelope of power efficient design.

Intel's Mobile Power Initiative is a coordinated industry-wide program that addresses these design challenges in three areas: system hardware, system software and application software. In addition to providing the industry with power-efficient processors and platform building blocks, Intel supports the Mobile Power Initiative through the annual development of Mobile Power Guidelines for system hardware and a wide array of development tools and specifications. For late breaking news on Mobile Power Initiative activities, please see the industry status section of this article or visit the [Mobile Power Initiative Web site](http://developer.intel.com/design/mobile/intelpower/index.htm) (<http://developer.intel.com/design/mobile/intelpower/index.htm>).

### System Hardware

Mobile PC users are demanding systems that are comparable to desktop PCs in performance and features including high-performance processors, 3D graphics and DVD drives. But as performance and features increase, so does the demand for power. Adding desktop-equivalent features has pushed mobile PC power consumption up an estimated 90 percent in the last 3 years (to an average of 19 watts in full size mobile PCs). In the same time frame, battery capacity has only increased an estimated 45 percent. If power is left unmanaged it could reach 35 watts by 1999, impacting battery life and inhibiting system design (See figure 1).

### Intel® Mobile Power Guidelines help developers manage system power

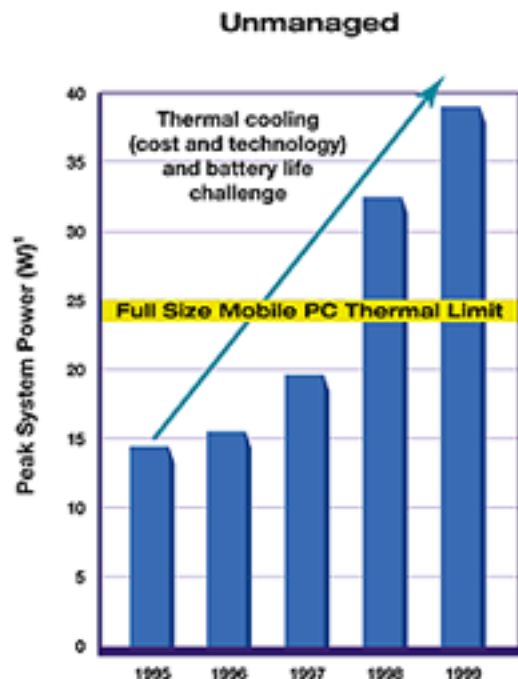


Figure 1

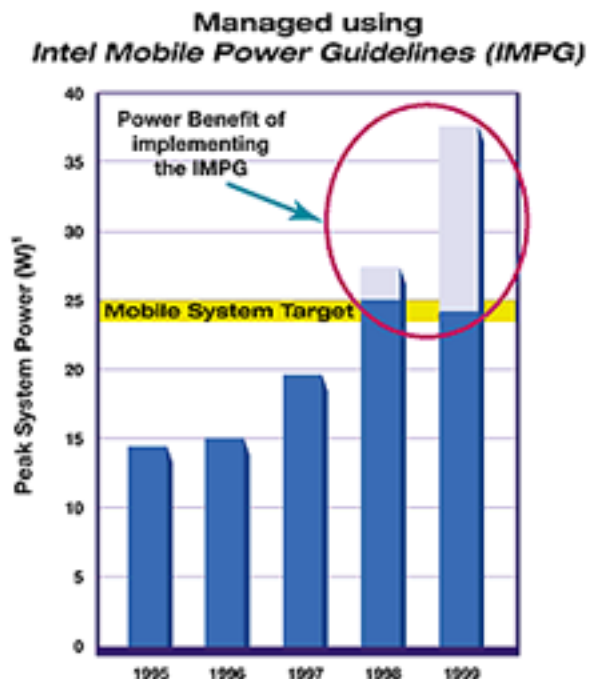


Figure 2

<sup>1</sup> Excludes Display. Source: Intel Mobile Power Symposium '97 and Mobile Power Guidelines '99



The Intel Mobile Power Guidelines were developed to help system developers balance user demand for more performance, compelling features, and battery life with the thermal design limits of smaller form factor devices. For example, the Mobile Power Guidelines outline a set of components with their associated power and voltage targets that could be delivered within the 25 watt thermal limit of most full size mobile PCs (See figure 2). To assist component developers in meeting these targets, design recommendations are included for most system components. Intel continues to implement power efficiency in its mobile processors and chipsets through a variety of design and voltage reduction techniques. The latest version of the Mobile Power Guidelines, published in December of 1997 for the '99 platform, are available for download at the Mobile Power Initiative Web site (<http://developer.intel.com/design/mobile/intelpower/index.htm>).

To help system and component vendors understand and measure system power, Intel has developed a tool called the Intel® Power Analyst (IPA). IPA is a power measurement tool that system developers can use to measure power consumed by a variety of mobile PC components in real time, including the CPU, memory, hard disk, graphics, audio and PC cards. IPA provides a graphic display of power consumption by each subsystem in addition to overall platform power. IPA results enable developers to tune components to meet power consumption budgets, using the techniques presented in the Mobile Power Guidelines. For further information about IPA, developers should contact their Intel representative or visit the Intel Mobile Power Tools Web site (<http://developer.intel.com/design/mobile/intelpower/tools/index.htm>).

### System Software

The Advanced Configuration and Power Interface (ACPI) is an open industry specification developed by Intel, Microsoft\* and Toshiba that enables the PC operating system to control power management. This new approach should lead to more efficient use of system resources by basing component usage more closely to the needs of the applications. ACPI-compliant systems are starting to enter the marketplace, and will be enabled by the upcoming releases of Microsoft Windows\* 98 and Windows NT\* 5.0. System and component developers should make sure their products are ACPI-ready. Software application developers should also take advantage of this new ACPI capability by implementing the appropriate APIs. See the application software section of this article for more information.

The Intel® Power Management Analysis Tool (IPMAT) is a hardware and software tool designed to help system and component manufacturers evaluate the ACPI power management capabilities of system hardware and devices. IPMAT tests the actual power consumption during different ACPI states at the system and device level and also tests latencies due to device-state switching. By checking for ACPI support in hardware, devices, drivers and applications, IPMAT enables faster development and can aid vendor selection and qualification. For additional details, visit the IPMAT Web site (<http://developer.intel.com/design/ipeak/pwrtool/index.htm>).

To make sure the user and operating system have more accurate information about the status of the battery, Intel and Duracell developed the Smart Battery System (SBS) specification. The SBS specifies intelligent circuitry inside rechargeable batteries that enables the transmission of accurate battery status data to the operating system's power management software. The Smart Battery Implementers Forum is now made up of over 30 member companies representing leaders in the mobile PC and battery industries. These companies continue to develop the SBS specification and are currently working on a new version. For more information or details on how you can participate, please visit the SBS Web site (<http://www.sbs-forum.org>).

### Application Software

Power-friendly software is essential to maximize battery life in mobile PCs. To assist application developers in this effort, Intel has developed Mobile Application Software Guidelines and tools. The Software Guidelines are available for review at Intel's Web site (<http://developer.intel.com/ial/ipm/w95app.htm>) or in the appendix of the Mobile Power Guidelines '99. They enable software developers to optimize application code to take best advantage of power-efficient microprocessors and other system power management features, including ACPI. Applications that are written to take advantage of ACPI are designed to help enable improved battery life through more efficient use of system components. To obtain guidelines on how to utilize Windows 32 API Extensions for OnNow to take advantage of this new ACPI capability, please visit Microsoft's Web site (<http://www.microsoft.com/hwdev/desinit/onnowapp.htm>).

Intel® Power Monitor 3.0 (IPM) is a complementary software tool that checks system activity to identify situations where applications may contain redundant or unnecessary power consumption code. IPM can capture certain command types that waste CPU cycles. Version 3.0 enables software developers to measure the impact of their applications on subsystem power, including total system, processor and rotating media power. The advantage of using IPM is that it can be used on an independent system without the addition of separate test equipment. Just download and install the software. IPM can also take advantage of the system power data provided by mobile PCs enabled with the Smart Battery System. Intel Power Monitor 3.0 is available for download from the [Intel Mobile Power Tools Web site](http://developer.intel.com/design/mobile/intelpower/tools/index.htm) (<http://developer.intel.com/design/mobile/intelpower/tools/index.htm>).

### Industry Status

Here are late breaking news items and activities that developers should be aware of.

With the introduction of the Mobile Pentium® II processor on April 2, 1998, ACPI-ready systems are now entering the market. When Microsoft Windows 98 and Windows NT 5.0 are introduced, operating system directed power management will be enabled for the first time.

To assist the industry in implementing ACPI, Intel recently hosted the ACPI Implementation Workshop. Please visit the Intel Power Initiative Web site to [download the conference course material](http://developer.intel.com/design/mobile/acpi.htm) (<http://developer.intel.com/design/mobile/acpi.htm>).

The Smart Battery Implementers' Forum recently held a Developers' Conference that involved over 60 companies in the mobile PC and handheld marketplace. Smart Battery and ACPI battery specifications were reviewed and a compatibility-testing event was held. A new version of the Smart Battery Specification is under development. Please visit the SBS Forum Web site for more information on the event or how you can [participate in the specification development](http://www.sbs-forum.org) (<http://www.sbs-forum.org>).

### Next Steps

Mobile PC and component developers should obtain a copy of the Intel Mobile Power Guidelines '99 and use available power-management tools to optimize power consumption of their system hardware. They should also make sure their components and systems support ACPI, in order to take advantage of the power management features in the forthcoming releases of Windows 98 and Windows NT 5.0. Application vendors should write their applications to take advantage of ACPI-ready systems by implementing power management related Windows 32 API Extensions.

### About the Author

Rusty Schafer is Strategic Platform Marketing Manager in Intel's Mobile & Handheld Products Group. He manages the development and implementation of strategic mobile computing initiatives that enable system and component manufacturers to design and deliver compelling high-performance mobile PCs. He also works with leading software developers and operating system vendors to help them develop compelling applications and operating systems that work well on mobile PCs.

### For more information

Intel Mobile Power Initiative Web site—

<http://developer.intel.com/design/mobile/intelpower/>

Intel Power Measurement Tool descriptions, features, and usage information—

<http://developer.intel.com/design/mobile/intelpower/tools/>

Mobile ACPI used for Operating System Directed Power Management—

<http://www.intel.com/mobile/mobilePCs/acpimen.htm>

Mobile Smart Battery System—

<http://www.intel.com/mobile/mobilePCs/sbsmen.htm>

Mobile Platform news monthly in *Platform Solutions*—

<http://developer.intel.com/solutions/platforms/mobile.htm>

## ***Manageability on the Move with the Mobile Pentium<sup>®</sup> II Processor***

By Naveen Musinipally  
*Mobile WfM Program Manager*  
Mobile and Handheld Products Group, Intel Corporation

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While the continued proliferation of mobile computers in today's Information Age has opened the door to many exciting opportunities, it has also created some challenges. For information technology (IT) professionals, finding ways to improve manageability and gain control of their mobile computing resources, while reducing the cost of owning and maintaining these resources is a significant challenge. Intel's Wired for Management (WfM) Initiative is addressing this challenge for mobile PC's, and its focus on Pentium<sup>®</sup> II mobile PC's will make them the most manageable mobile computers available.

Most mobile PC users have requirements that are very different from their desktop counterparts. They often prefer to travel light and are forced to add, or swap peripherals such as PCMCIA cards and CD-ROMs, thus altering the configuration of their PC's. In addition, since they often have to work remotely, these users have to deal with the limited available bandwidth of dial-up telephone lines. This limits their ability to have timely access to information and technical "help desk" support.

Time spent disconnected from the enterprise can also result in delays in obtaining access to the latest versions of files and applications—changes that today are routinely updated in automated fashion for desktop users who are always attached to corporate intranets. According to a Gartner Group study in the first quarter of 1998, an unmanaged mobile PC today ends up costing an organization approximately \$12,000 a year.

The ultimate goal for the IT staff is to be able to provide the same level of support to remote mobile users as is provided to connected desktop users. Achieving this goal will ultimately result in reduced costs for IT organizations. They will see improved asset management, greater control over the network, faster deployment of systems and applications, and ongoing help desk support—no matter how remote the user's location might be, all while providing a better level of service to mobile users improving their productivity.

### **Intel's Commitment to Mobile Manageability**

Just as Intel is playing a key role in leading the WfM initiative across the industry for the desktop PC, Intel is actively involved in leading mobile manageability. Intel's efforts to enable the Mobile PC developer community in designing manageable mobile PCs focuses on three principal areas. The first is defining open specifications, such as the WfM Baseline Specification Version 1.1. The second is providing a comprehensive set of development tools to implement mobile systems that support the specifications. And the third area is delivering products that meet the specifications and provide manageability benefits for mobile users.

### **WfM Baseline Specification—Version 1.1**

The WfM Baseline Specification Version 1.1 addresses mobile, desktop and server platforms. This specification calls out the minimum features every corporate PC should have to support baseline management capability and interoperability within the enterprise. Included in this version are mobile-specific requirements such as dynamic instrumentation and system power management.

WfM Version 1.1 defines the attributes required for mobile instrumentation. Mobile instrumentation is software that reports the management features and capabilities of a system, including its hardware and software components. Instrumentation provides several key manageability benefits such as, asset management, and remote system monitoring to assess the health of a PC. The Advanced Configuration and Power Interface (ACPI) specification is another component of WfM 1.1. The ACPI specification was developed by Intel, Microsoft and Toshiba to allow the operating system to intelligently and efficiently manage the power consumption of various PC subsystems in order to improve efficiency and extend battery life. ACPI will also help enable the implementation of features such as Wake-on-LAN in future mobile PC designs.

**Intel's Mobile Component Instrumentation SDK**

The Intel® Mobile Component Instrumentation (IMCI) SDK provides the tools, utilities and sample code that helps hardware and software developers create component instrumentation for their mobile PC products. Working in conjunction with the Intel® Desktop Management Interface (DMI) 2.0, this set of tools provides features needed for dynamic loading and unloading of instrumentation and supports hot-pluggable devices, such as PC cards and docking stations.

The IMCI SDK enables developers to create instrumentation with a minimum of design and coding time. It includes a Component Instrumentation (CI) Manager that can help simplify instrumentation development, sample instrumentation that covers most mobile system attributes and can be extended by the developer, and a CI Manager Debug Viewer that enables developers to find and fix instrumentation problems. The SDK provides minimum instrumentation that is required to meet the WfM specification. Developers can also customize instrumentation to differentiate their specific implementation. A complimentary copy of the SDK can be downloaded from Intel's WfM Developer Web site ([http://developer.intel.com/ial/wfm/tools/imci\\_sdk/index.htm](http://developer.intel.com/ial/wfm/tools/imci_sdk/index.htm)).

**Intel® LANDesk® Client Manager**

The third area in which Intel is working actively to promote mobile manageability is on the product front. Intel's LANDesk® Client Manager 3.2 is an application that recognizes the unique nature of Mobile PC's and simplifies the management of mobile client systems. LANDesk Client Manager 3.2 provides the same degree of manageability to mobile users, both in and out of the office, as is provided for their desktop counterparts.

LANDesk Client Manager monitors the health of a PC to provide local and remote alerts, offers local and remote views of hardware and software components, and supports such industry initiatives as WfM, DMI, and Simple Network Management Protocol (SNMP). The new advanced features of version 3.2 include remote dial-up and recognition of swappable devices such as PC cards and docking stations. LANDesk Client Manager 3.2 also integrates features of the IMCI kit providing for easy one-step installation.

**Manageability on the Move**

Moving forward, Intel will continue to work with OEMs and the IT community to help reduce the cost of ownership and provide substantial benefits to users on "both ends of the wire" —the mobile PC user and the IT administrator. OEMs in the mobile arena should plan on making their mobile Pentium II processor-based systems WfM enabled to add real value to their platforms. Companies like Toshiba and IBM are already shipping WfM enabled mobile Pentium II processor-based systems, and many more from the mobile PC industry are expected soon. Be sure to speed up your time to market by taking advantage of Intel's tools like the IMCI SDK. As the future unfolds, you can expect to see more new tools, products, and building blocks from Intel that support the implementation and improvement of mobile PC manageability.

**About the Author:**

Naveen Musinipally is a Mobile WfM Program Manager for Intel. He is responsible for developing and executing Intel's mobile manageability marketing plans and efforts.

**For more Information:**

Manageability resources for developers—

[http://www.intel.com/design/mobile/wired\\_mgmt.htm](http://www.intel.com/design/mobile/wired_mgmt.htm)

Intel Wired for Management developer site—

<http://developer.intel.com/ial/wfm/>

Intel "Managed PC" site for IT—

<http://www.intel.com/managedpc/>

Mobile PC Enterprise solutions site—

<http://www.intel.com/mobile/enterprise/index.htm>

Wired for Management technology news—

<http://developer.intel.com/solutions/tech/wfm.htm>

## ***The Mini-Notebook PC: A Formidable Lightweight Contender***

By Terran Reneau and Dave Kaufman  
Platform Marketing Program Managers  
Mobile and Handheld Products Group, Intel Corporation

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As mobile computing continues to proliferate, new market segments and opportunities are emerging that promise to make the next 18 months a time of significant change. One of the most prominent of these opportunities is defined by a new class of very low-cost, highly portable systems, currently positioned between today's basic mobile PCs on the one hand, and personal digital assistants (PDAs), handheld organizers, and other low-cost, non-PC devices on the other. While many non-PC devices will grow into similarly sized form factors later this year, none are expected to be able to augment existing PCs, utilize the more than 8,200 PC software titles now available, or maintain compatibility with today's IT infrastructures in the way that this new class of mobile computer can.

Enter the Mini-Notebook PC—a mobile computer that is more portable and less expensive than today's prevailing thin & light and full-featured notebook PCs, while still providing users with a full range of Intel® Architecture PC functionality generally lacking in low cost (<\$1,000) non-PC devices now on the market. Highly portable, Mini-Notebook PCs are already enjoying considerable market success in Japan, where they're being used by salespeople, field workers, and other mobile professionals as their second PC systems. The same kinds of users with the same kinds of augmentation needs also exist in the U.S., but as yet very few products are being offered domestically that meet the needs of this market segment. That is about to change.

### **The Best of Both Worlds**

Mini-Notebook PCs based on the Intel Architecture will begin to broadly appear on the U.S. market in the second half of 1998, with 1999 expected to be the year in which Mini-Notebook PC segment growth really takes off. The advantage of these systems is that they provide users with Intel Architecture PC functionality—e-mail performance, compatibility, file transfer capabilities, Internet access, etc.—in a smaller form factor and at lower cost. These characteristics make them ideal secondary systems for large business users who require augmented PC mobility. Additional growth opportunities may also exist where lower-priced, full-function mobility is desirable, including vertical applications, small business users, students, consumers and children.

What precisely defines a Mini-Notebook PC? At 3 pounds and less, it can weigh as little as half as much as its basic mobile PC counterparts. For starters, it contains a hard disk drive (1.6–2.1 GB), with optional external floppy or CD-ROM drives that can be plugged in as needed. It runs the Windows® 9X and NT operating systems, has a battery life of more than 3 hours, and provides complete manageability, e-mail, file and calendar synchronization, Internet access and presentation capabilities.

The Mini-Notebook PC utilizes commonly available “off-the-shelf” software to provide fully compatible file transfers with its larger desktop and mobile counterparts. This allows for seamless and immediate work productivity and flexibility across multiple software applications without conversion. Mini-Notebook PCs also incorporate Wired for Management (WfM) (<http://developer.intel.com/solutions/issue/stories/top3.htm>) technologies to lower total cost of ownership (TCO) in corporate enterprises. And they're highly usable, with touch-type keyboards and screens ranging in size from 8.4–10.4 inches and supporting today's popular display technologies.

Currently available Mini-Notebook PCs employ low-voltage Intel® Pentium® processors with MMX™ technology, which are manufactured using 0.25-micron process technology. Newer processors, that will be further optimized to provide even lower power for improved thermal management and longer battery life, are slated for introduction in the second half of 1998, with continuing clock speed increases. Most Mini-Notebook PCs will offer 16–32 MB of upgradable memory, up to two PCMCIA card slots, and complete modem functionality for online and network access.

So much for performance, functionality and form factor. The other key characteristic that separates the Mini-Notebook from other mobile PCs is its low cost. Today, the least expensive “thin & light” mobile PCs available are still priced at well above \$2,000. The first wave of compelling, low-cost Mini-Notebook PCs in the U.S. are already priced as low as \$1,499 with prices expected to drop to as low as \$999 in 1999.

### Enabling the Mini-Notebook Opportunity

Mini-Notebook PCs provide an excellent solution to the “low cost and highly portable” user and application segment that is steadily emerging around the world. If a comparable percentage of PC users in the U.S. buy Mini-Notebook PCs to augment their existing systems with the enthusiasm with which users have adopted them in Japan, the resultant total available market (TAM) expansion could soon represent hundreds of millions of dollars of new growth revenue.

To support this evolution and potential growth, Intel is actively participating on a number of fronts. New lower-power processors will be introduced to meet the needs of the Mini-Notebook market segment, complemented by Intel chipsets that meet mobile requirements. Intel also continues to work closely with the industry to drive new standards for screen displays, like High Performance Addressing (HPA). Intel is also an important force in helping to enable today’s Mobile Power Initiative (<http://developer.intel.com/solutions/issue/stories/top2.htm>) and Wired for Management (WfM) baseline specification—both of which will significantly influence the development and evolution of the Mini-Notebook PC.

Over the years, users have continually prized the software compatibility that the Intel Architecture-based PC platform has provided. Now that compatibility and full range of PC functionality is being extended to provide a compelling PC work platform that within a year will be available for less than \$1,000. That is the vision of the Mini-Notebook PC Platform—a vision that will soon be coming into view for OEMs, IHVs and users on today’s mobile computing landscape.

### About the Authors:

Terran Reneau is responsible for developing and executing Intel’s “Mini-Notebook PC” marketing plans, along with driving the platform technologies surrounding the microprocessor which create additional demand for existing and emerging mobile systems.

Dave Kaufman is responsible for developing and executing Intel’s basic mobile PC marketing plans, along with developing platform configurations and BOM analyses in support of new platform technologies around Intel’s mobile microprocessors.

### For more Information:

Intel’s Mini-notebook PC site—

<http://www.intel.com/mobile/mobilePCs/mini.htm>

Mobile PC developer site—

<http://developer.intel.com/design/mobile/>

Mobile Platform news—

<http://developer.intel.com/solutions/platfms/mobile.htm>

Intel’s Mobile PC home page—

<http://www.intel.com/mobile/index.htm>



## Looking Forward to Windows NT\* Workstation 5.0

By Shannon Perdue  
Windows NT Product Manager, Microsoft Corporation

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Microsoft Windows NT\* Workstation 5.0 will be the most important new operating system ever created for customers of the Microsoft Windows\* operating system, particularly those in businesses or organizations. As the most powerful 32-bit operating system ever created for the PC, Windows NT Workstation 5.0 will deliver the superior performance, network reliability and manageability that business users require—especially for “new-generation” applications such as multimedia, Internet and data visualization software. To meet the increasing demands of these innovative applications, Windows NT Workstation performance scales as users add higher processor performance and memory. Users will realize best performance on systems with a high-end Intel® Pentium® II processor and 64 Mbytes of RAM.

### One Operating System for Multiple PC Platform Types

Windows NT Workstation 5.0 builds on the well-established advantages of Windows NT Workstation 4.0 to offer a single operating system solution that is capable of spanning the entire range of platform types: from mobile PCs to desktop PCs and servers. On notebook computers, Windows NT Workstation 5.0 will provide great performance and security with the same Plug and Play capabilities that Windows 95 offers today. This platform synergy offers businesses the advantages of “one-stop shopping” for an operating system that reduces the total cost of ownership (TCO), in addition to delivering new reliability, security, and networking capabilities. While Windows NT Workstation 5.0 delivers the best support for new and emerging applications, it also incorporates new hardware features to support the continuing evolution of the PC platform.

The never-ending quest by businesses for more sophisticated, better performing, more reliable and more cost-effective applications continues to drive the widespread adoption of the Windows NT operating system. According to Dataquest, while 7 percent of PC shipments were Windows NT desktops in 1997, this component is expected to rise to approximately 31 percent of annual shipments by the year 2000. The availability of Windows NT Workstation 5.0 will help fuel this trend.

### Reducing TCO

Windows NT Workstation 5.0 will help businesses reduce TCO up to 50 percent, compared to PCs running other versions of the Windows operating system. This dramatic improvement is enabled by the introduction of innovative PC management technologies, including *IntelliMirror\**. Combining the flexibility of distributed computing with the reliability and security of a tightly managed environment, *IntelliMirror* “intelligently mirrors” the user’s system, including data, applications, system files and administrative settings, on Windows NT 5.0 servers. *IntelliMirror* literally eliminates the necessity of visiting individual PC platforms for any software-related issue. In addition, it allows administrators to quickly replace broken PCs and apply policies to users or groups of users throughout the enterprise, including “roaming” networked mobile PC users.

### “New Generation” Application Support

One of the unique strengths of Windows NT Workstation 5.0 is the optimized support it provides for the new generation of distributed applications written through Microsoft Windows DNA, including applications for user interface and navigation, business process and storage. Windows DNA integrates Web and client/server application development models through the Component Object Model (COM). This is a language-independent object model that provides a standard way for applications to interoperate at all tiers of the architecture. Software developers can extend any part of the application by using components that can be written in C++, Visual Basic\*, Java\* or other languages.

### Supporting the Platform

Windows NT 5.0 is designed to support the ongoing evolution of the PC platform by integrating enhancements that simplify device management and the development of new device drivers. This includes support for the OnNow design initiative, Advanced Configuration and Power Interface (ACPI) power management, Plug and Play and low-level hardware instrumentation. The system-wide architecture for power management allows for system hardware, add-in cards, the operating system and



application software to all participate in power management with standard interfaces. Leveraging all of the information relating to the state and capabilities of different platform elements into the operating system delivers a robust and well-adapted system for end users.

### **The Win32 Driver Model**

The Win32 Driver Model (WDM) is based on the Windows NT driver model. Windows NT Workstation 5.0 supports WDM drivers for USB, IEEE 1394, audio, input devices (including low-latency DirectX\* interfaces for AGP), still imaging devices and scanners (via parallel, SCSI and USB connections) in addition to video imaging devices, including DVD, MPEG-2 playback and video cameras.

### **Optimized for the Pentium® II Processor**

Microsoft and Intel have worked together for years to deliver a truly complementary platform solution. Engineering teams from both companies conduct ongoing discussions to ensure that Windows NT Workstation 5.0 is optimized and tuned for the Intel® Architecture. Microsoft's engineers, with support from Intel, are delivering a scalable kernel, and tools teams are incorporating Intel Architecture based features. In addition, optimization is also underway for Intel's IA-64™ architecture to allow Windows NT Workstation 5.0 to support future-generation processors. Regardless of the computing model or 32-bit application, deployment of robust and scalable PC platforms based on the Pentium II processor is an intelligent decision for businesses—and for the OEMs who serve them.

### **Next steps**

Designing PC platforms with Pentium II processors and 64 Mbytes of RAM assures that users will experience all the advantages of Microsoft Windows NT Workstation 5.0, including high performance, security, networking reliability and manageability.

### **About the Author:**

Shannon Perdue is a Windows NT Product Manager at Microsoft Corporation. Windows NT Workstation and Server 5.0 are currently in Beta One, with Beta Two expected in the Summer 1998.

### **For more Information:**

For additional information about Windows NT Workstation 5.0, please visit the Microsoft Web site—

<http://www.microsoft.com/ntworkstation/info/50.htm>

The PC 99 Design Guide Review is available at the Microsoft Web site—

<http://www.microsoft.com/hwdev/pc99.htm>

and at Intel's Developer Web site—

<http://developer.intel.com/design/desguide/>

For more information on Pentium II processor performance, visit Intel's Web site—

<http://www.intel.com/procs/perf/PentiumII/index.htm>

Additional information on platforms for business computing is available at Intel's Business Computing site—

<http://www.intel.com/businesscomputing/desktop/index.htm>

News and information on all hardware platforms is also available at *Platform Solutions News* online—

<http://developer.intel.com/solutions>



## ***The Lean Client: New Horizons for the Intel® Architecture***

By Ron Peck

Director of Marketing: Business Desktops  
Business Platforms Group, Intel Corporation

*As new computing models continue to emerge, Intel is actively working to extend the benefits of the Intel® Architecture to encompass all aspects of enterprise computing. A case in point: the lean client.*

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Much has been written about the new wave of stripped-down, diskless computing devices, and the potential ramifications they could have on the future of enterprise computing. Industry analysts point to some 30 to 50 million text-based "green screen" and other dumb terminal devices that are nearing the end of their useful life cycles, leaving them ripe to be replaced by emerging thin clients. To support these devices, Intel is developing a set of guidelines designed to define a new paradigm known as the "lean client"—a range of non-PC computing devices that benefit from the performance and compatibility of the Intel® Architecture (IA), while meeting the evolving price/performance requirements of the enterprise.

### **Emerging Computing Models**

Intel has identified three emerging client/server computing models being used in the enterprise today: the connected PC, server-centric computing, and network-centric computing. The first of these—the familiar connected PC—is defined by robust, IA-based clients that offer a fully integrated application environment where data and applications reside on the client. With the server-centric model, data and applications reside and execute on the server, while the client handles only data entry and information display. The network-centric model relies on the ability of servers and the network to deliver applications to the client—applications and data reside on the server and applications are downloaded to the client for execution.

Intel is enabling building blocks (from IA microprocessors to platforms, technologies, software and specifications) that bring the advantages of the Intel Architecture to all three models. As introduced in the March issue of *Platform Solutions*, Intel is also enabling a fourth model that encompasses the benefits of the other three called Balanced Computing (<http://developer.intel.com/solutions/archive/issue7/stories/top3.htm>).

### **The Lean Client**

Intel's lean client specifications are being developed to support the server-centric and network-centric models and the significant market opportunity they represent. Lean clients functioning in server-centric, non-PC computing environments act as network terminals, only performing tasks that are focused around display rendering and the collection of keystrokes. With the exception of display logic being handled at the client, all of the processing in this model is performed at the server. As a network terminal, the lean client is ideal in cases where users work with a limited set of applications, share desktops, use centralized data, or work at a distant site.

A typical lean client network terminal device includes an Intel® microprocessor (from the Pentium® processor to new processors based on the P6 microarchitecture), configurable RAM, a LAN interface, and a client operating system that provides the necessary infrastructure for executing client software display protocols and services. These devices have no local disk or external storage; as such, they're closely coupled to the network server, which hosts applications or routes user input to applications that run on application servers.

Lean clients are also ideal for use as network-centric computing devices, to support knowledge workers and power users engaging in productivity and groupware applications, Internet, intranet and extranet information gathering, as well as other advanced enterprise computing applications. As in the server-centric model, a network computer usually has no disk and relies completely on the server for storage, boot and network configuration information. The main difference is that the network computer executes application code locally, enabled by client operating systems that support multitasking and diskless clients.

The lean client as a network computer can be configured to run Java\* with a Java Virtual Machine that executes Java byte codes residing on servers, native operating systems and applications, Internet browsers and network terminal display protocols. Compared to network terminals, these devices require greater local processing power, larger memory capacity (8–128 MB of RAM), a LAN interface and multimedia options.

### **A Value Proposition**

In the face of today's increasingly complex enterprise computing trends, IA-based lean client devices used in both the server-centric and network-centric computing models will offer a number of substantial benefits, including: price/performance; manageability; and software compatibility. Ultimately, the operation of lean clients will depend heavily on the server for all computing and storage resources, placing significant demands on server availability, manageability and scalability. Standard high-volume (SHV) servers (<http://developer.intel.com/solutions/archive/issue5/focus.htm>) based on the Intel Architecture are optimized to work closely with lean clients, due to the configuration flexibility that enables them to provide IT managers with extensive control and balanced availability and performance.

### **Specification Underway**

Intel is currently in the latter phases of defining a set of lean client specifications, and is working closely with more than 12 OEM partners to solicit input across the industry. Once the feedback process is complete, Intel plans to make the Intel Architecture Lean Client Guidelines specification available by mid-1998. With its ability to help enable truly complete lean client solutions, Intel is extending the Intel Architecture into the evolving server-centric and network-centric computer markets, providing support at "both ends of the wire" (clients and servers), and offering a common architecture that enables easy integration with IA-based servers. OEMs interested in developing lean client solutions are encouraged to contact Intel and learn more about the lean client specification.

### **About the Author:**

Ron Peck is Director of Marketing: Business Desktops in Intel's Business Platforms Group. He is responsible for marketing Intel's wide range of business desktop platforms including Desktop PC's, Network PC's (Net PCs), and Lean Clients. This includes engagement with major PC manufacturers, diffusion of core technologies, and industry marketing of platform specifications.

### **For more Information:**

Recent Citrix News Release: Citrix and Intel Demonstrate First Thin-Client/Server System Based on Intel's Lean Client Guidelines—

<http://www.citrix.com/news/releases/prApr11.htm>

Recent IBM News Release: IBM Tuning JavaOS for Business to Network Computers Based on Intel® Processors—

<http://www.ibm.com/java/javaos/news2.html>

Balanced Computing Model; top story in March Platform Solutions from Intel's Distributed Enterprise Architecture Lab—

<http://developer.intel.com/solutions/archive/issue7/stories/top3.htm>

Business Platform news—

<http://developer.intel.com/solutions/platfms/business.htm>

Server Platform news—

<http://developer.intel.com/solutions/platfms/server.htm>

## **Platform News**

### ***Business***

#### **Intel and Tivoli Simplify Desktop Management, Reduce Total Cost of Ownership**

Personal computers based on the Intel-led and industry-supported Wired for Management (WFM) Baseline specification now will be "Tivoli-Ready." This means that Intel® Architecture-based workstations, desktops and laptops can be managed "out-of-the-box" by Tivoli Management Software. This is achieved by the automatic downloading and installation of a Tivoli Management Agent when the PC is initially installed, reducing the manual effort required to get new PCs online and managed.

<http://www.intel.com/pressroom/archive/releases/wm042798.htm>

#### **Updated Wired for Management Tools and Specifications**

The Wired for Management developers Web site (<http://developer.intel.com/ial/wfm/>) has been updated with the following tools and specification revisions:

Preboot Execution Environment PDK Version 2.4

<http://developer.intel.com/ial/wfm/tools/pxe/index.htm>

SM BIOS Specification Version 2.2

<ftp://download.intel.com/ial/wfm/smbios.pdf>

### ***Home***

#### **Kodak and Intel Announce Series Of Agreements To Promote Pictures, Digital Imaging**

Eastman Kodak Company and Intel Corporation today announced a series of agreements with the goals of expanding the way people create, store, use and share pictures and of removing the boundaries between digital and traditional imaging. Product development and joint marketing efforts are the focus of these agreements.

<http://www.intel.com/pressroom/archive/releases/PI043098.HTM>

#### **Intel Enabling In-Car Computing**

Intel is working with the industry to enable new in-car computing communication, navigation, entertainment and information applications using technologies for In-Car Computing combined with Intel® Architecture-based PCs.

<http://www.intel.com/technology/carpc/>

### ***Mobile***

#### **Telecommunications and PC Technology Leaders Join to Deliver Enhanced Wireless Communications Solutions**

On May 20, 1998 industry leaders Ericsson, IBM, Intel, Nokia and Toshiba unveiled their vision to revolutionize wireless connectivity for personal and business mobile devices. Enabling seamless voice and data transmission via wireless, short-range radio, this new technology will allow users to connect a wide range of devices easily and quickly, without the need for cables, expanding communications capabilities for mobile computers, mobile phones and other mobile devices, both in and out of the office. The open specification for this innovative technology, code-named "Bluetooth," is being developed through the combined contributions of the members of the Bluetooth Special Interest Group (SIG).

<http://www.intel.com/design/mobile/bluetooth/>

### ***Server***

#### **Intel Enhances Performance of Gigabit Connectivity**

Intel helped substantially increase the performance of Gigabit Ethernet server connections with the introduction of new solutions ranging from silicon to systems. The Intel® Express Gigabit Switch provides a 32 Gbps (gigabits per second) nonblocking wire-speed throughput on all ports and modules helping to enhance network speed from switched connections to the backbone. Through Intel's unique silicon integration capabilities, the Intel® PRO/1000 Gigabit Server Adapter helps to enable breakthrough server performance at nearly twice the industry average of other Gigabit Ethernet adapters and at nearly one-half the price. These two products, combined with Intel's existing line of networking products, offer more

comprehensive network solutions for campus networking environments by enabling scalability from 10 Mbps (megabits per second) to 100 Mbps to 1,000 Mbps.

[http://www.intel.com/network/gigabit/index.htm?iid=nbm+esg\\_gig](http://www.intel.com/network/gigabit/index.htm?iid=nbm+esg_gig)

### **Revision 0.6 of the SSI Draft Specifications Now Available**

Server Systems Infrastructure revision 0.6 draft specifications available on entry server power supply and electronics bay, midrange server power supply and electronics bay, high-end integrated server power supply, and the high-end modular (single voltage) power supply. Sign the contributor agreement required to view future drafts and download your review copies today.

<http://www.ssiforum.org>

## **Workstation**

### **Intel Announces Agreement with Silicon Graphics**

Silicon Graphics has outlined its new strategic direction which includes an agreement with Intel on workstations. Under terms of the agreement, SGI will introduce an entire line of products, including workstations, servers and supercomputers, based on the Intel Architecture, and will port their UNIX\* IRIX\* operating system to the Intel® Merced™ processor. The agreement also includes a broad patent cross-license between the two companies.

<http://www.intel.com/pressroom/archive/backgrnd/cn041498.htm>

## **Technology News**

### **AGP**

#### **Intel Provides Leading-Edge Development Tools for the Intel740™ Graphics Accelerator**

In a continued effort to provide Independent Software Vendors (ISVs) with advanced optimization tools for the Intel Architecture, Intel introduced a new Intel740™ graphics accelerator Performance Software Developer's Kit (SDK) aimed at enabling the development of applications optimized for the Pentium® II processor platform with the Intel740 graphics accelerator. This Performance SDK includes a new optimization utility using the Intel® Observation Architecture (OA), which allows developers to quickly identify and eliminate performance bottlenecks in applications.

<http://www.intel.com/pressroom/archive/releases/CN050598.HTM>

#### **Intel Introduces Intel® Express 3D Graphics Card**

Intel has introduced the Intel Express 3D graphics card, its new high-quality graphics solution targeted at the mainstream PC market. Based on the innovative Intel740 graphics chip and optimized for the Pentium II processor platform, the Intel Express 3D graphics card delivers exceptional graphics performance and quality at mainstream prices for business and entertainment PCs. Available in 2- and 4-MB versions, the Intel Express 3D is available today in single or 10-packs as part of the Intel® Products Dealer program, providing a high-quality graphics solution for Intel Pentium II processor VARs, system integrators and resellers.

<http://www.intel.com/pressroom/archive/releases/cn041598.htm>

### **DVD**

#### **Intel Developer Forum DVD Plugfest Coming on June 16-17**

The best opportunity to test your DVD product with others in the industry is at the upcoming Intel Developer Forum DVD Plugfest. This event is hosted by Intel Corporation to promote the development of interoperable DVD products for personal computers. The primary function of this event is interoperability testing. In addition, attendees will have the opportunity to: experience DVD OEM matchmaking; hot DVD-ROM bundling opportunities; get the scoop on DVD retailing; see the coolest new DVD-ROM titles; attend one-on-one sessions with DVD technical experts; participate in roundtable discussions on DVD state of the union; and see demonstrations of the Pentium II Xeon™ processor and the Intel® Celeron™ processor-based systems.

System OEMs, graphics hardware vendors, CODEC suppliers (hardware and/or software), DVD drive manufacturers, and software/movie content providers should plan on attending.

<http://developer.intel.com/solutions/tech/plugfests/>

**New DVD Technology Newsgroup Now Available**

We are pleased to announce the creation of the DVD technology newsgroup. We encourage you to visit the group and submit any questions that you may have regarding DVD technology and its implementation on the PC platform.

<http://support.intel.com/newsgroups/dvd.htm>

**Audio****Updated Audio Codec '97 (AC '97) Specification Version 2.1 to be Available**

Intel will make available a new, updated version of the Audio Codec '97 (AC '97) specification (version 2.1) on the AC '97 Web site by June 1, 1998.

<http://developer.intel.com/pc-supp/platform/ac97/>

**New Audio Modem Riser (AMR) Specification 1.0 Coming Soon**

Look for the new Audio Modem Riser Specification (AMR) 1.0 to be published on the Intel AC '97 Web site in July of 1998. This specification will enable OEMs to offer the cost benefits of Modem on the motherboard, while maintaining the flexibility offered in a riser solution that minimizes Modem certification requirements. To view an example of an Audio Modem Riser system block diagram to be supported in the specification, visit the Audio technology page at *Platform Solutions* online today.

<http://developer.intel.com/solutions/tech/audio.htm>

**USB****Simple Rules in Building USB Devices and Cable Assemblies**

USB technology promises end users the ability to hot-attach peripherals and adapters, an evolutionary next step in plug-and-play expansion without opening the box. To deliver on this promise, device and interconnect providers need to adhere to a few simple rules. A short summary of these rules is now available at the USB technology page in *Platform Solutions*.

<http://developer.intel.com/solutions/tech/usb.htm>

**1394****New 1394 Technology Newsgroup Now Available**

We are pleased to announce the creation of the 1394 technology newsgroup. We encourage you to visit the group and submit any questions that you may have regarding 1394 technology and its implementation on the PC platform.

<http://support.intel.com/newsgroups/1394.htm>

**Instantly Available PC****New Instantly Available PC Technology Newsgroup Now Available**

We are pleased to announce the creation of the Instantly Available PC technology newsgroup. We encourage you to visit the group and submit any questions that you may have regarding Instantly Available PC power management technology and its implementation on the PC platform.

<http://support.intel.com/newsgroups/iapc.htm>

**Networking****Intel Introduces Industry's Most Advanced Fast Ethernet Networking Controller**

Extending its leadership in fast ethernet networking silicon, Intel announced the industry's first multiplatform, single-chip fast ethernet controller, the 82559. As a common solution for multiple Intel Architecture platforms—servers, desktops, Network PCs and mobile clients—the 82559 eliminates the need for IT managers to test, support and manage different networking solutions for each of those platforms. The 82559 also integrates new advanced management capabilities yet it is 75 percent smaller, requires 80 percent less power and provides lower CPU utilization than any other fast ethernet controller in the industry.

<http://www.intel.com/pressroom/archive/releases/FE052698.HTM>

## **PC 98 and PC 99**

### **See the Latest Updates to the PC 98 System Design Guide**

Requirements for PC 98 have been updated in the following chapters: Mobile PCs, Graphics Adapters, USB, Monitors, Storage and Related Peripherals. You can view short descriptions of these changes at the PC 98 technology page in Platform Solutions online.

<http://developer.intel.com/solutions/tech/pc98.htm>

### **Version 0.7 of the PC 99 System Design Guide Now Available for Review**

The PC 99 co-authors held a well attended industry design review meeting on April 21. As a result draft version 0.7 of the PC 99 System Design Guide is now available for review. OEMs and IHVs are strongly encouraged to review and comment on the proposed PC 99 guidelines, and the industry is also encouraged to contribute additional issues to be considered for inclusion in the guidelines. Version 0.9 is expected to be available by June 15.

<http://developer.intel.com/design/desguide/>

### **Summary of Differences between PC 99 and PC 98 Updated**

The summary of differences between PC 99 and PC 98 has been updated on the PC 98 and PC 99 technology page at *Platform Solutions* online.

<http://developer.intel.com/solutions/tech/pc99.htm>

## **Platform Performance Tuning**

### **Intel Ships IPEAK Graphics Performance Toolkit (GPT) Version 1.0 on May 15<sup>th</sup>**

The GPT is priced at \$279 and can be ordered by calling 1-800-538-3373 ext. 301 (U.S. and Canada) and 1-503-727-7897 (international). Additional pricing and ordering information is available at the IPEAK Web site.

<http://developer.intel.com/design/ipeak/order.htm>

### **IPEAK Training Class on the Storage Toolkit at Intel on June 4**

This class is free. Registration is currently open to the public. Space is limited. To register, please send an e-mail to IPEAK@intel.com with your name, company name, e-mail address, phone number and mailing address. For details on the agenda and logistics please visit the IPEAK training Web site.

<http://developer.intel.com/design/ipeak/training.htm>

### **New White Papers Available Describing IBASES and IPMAT Tools**

New white papers are now available to help customers understand the tool features and functionality more easily and get a jump-start on using the tools. The white papers are titled "IBASES Quick Start Guide" and "Overview of IPMAT" and are available for download at the IPEAK Web site.

<http://developer.intel.com/design/ipeak/>

## **System Design**

### **New White Paper on Tool Capabilities for Designing 100-MHz Interconnects**

Printed circuit board design complexity increases greatly as bus speeds exceed 100 MHz. This increased complexity is due more to the large number of simulations a designer must complete rather than simulation or modeling accuracy. This paper presents the case for these increased numbers of simulations, and presents techniques for managing this complexity including the usage of 3D simulation tools.

[http://developer.intel.com/ial/sdt/tsch\\_asp.pdf](http://developer.intel.com/ial/sdt/tsch_asp.pdf)



## **Industry Events**

### **ATM Expo '98**

June 1–05, San Jose, CA

Event dedicated exclusively to Asynchronous Transfer Mode and broadband technologies. Intel's Mitch Shultz will be presenting "Servers and ATM" on June 5th. For more information, please visit the event Web site.

<http://www.atmyear.com/atmyear98us/index.htm>

### **IPEAK Training Class on the Storage Toolkit**

June 4, Santa Clara, CA

This class is free and is held at Intel Corporation. Registration is currently open to the public. Space is limited. To register, please send an email to [IPEAK@intel.com](mailto:IPEAK@intel.com) with your name, company name, e-mail address, phone number and mailing address. For details on the agenda and logistics please visit the IPEAK training web site.

<http://developer.intel.com/design/ipeak/training.htm>

### **DVD Plugfest**

June 16–17, South San Francisco, CA

The upcoming Intel Developer Forum DVD Plugfest will be held in South San Francisco, California. This event is sponsored by Intel Corporation to promote the development of interoperable DVD products for personal computers.

<http://developer.intel.com/solutions/tech/plugfests/>

### **PC Expo '98**

June 16–18, New York, NY

An international broad based computer show. For information please visit the PC Expo Web site.

<http://www.pcexpo.com>

### **Web Design & Development '98 West**

June 21–25, San Francisco, CA

This conference is designed to connect web developers and offer education about how to improve web design. Intel's Jerry Weber will be presenting "Low Bandwidth Special Effects for the Internet" on June 25<sup>th</sup>. For more information, please visit the event Web site.

<http://www.web98.com>

### **2nd Annual U.S. 1394 Developer's Conference**

June 29–July 2, San Jose, CA

Please visit the 1394 event site for more details.

<http://www.1394ta.org/upevents/overview.htm>

### **Internet World—summer**

July 13–17, Chicago, IL

Focuses on breakthrough technologies and products from leading innovators, devoted exclusively to the Internet and World Wide Web. Intel's Ken Stober to present PC/TV. For more information visit the Internet World web site.

<http://events.internet.com>

### **Siggraph '98**

July 21–23, Orlando, FL

Provides marketplace for computer graphics equipment and services. For more information please contact the Siggraph web site.

<http://www.siggraph.org/s98/s98main.html>

**HP World '98**

August 2–8, San Diego, CA

HP strategic and tactical solutions come together at this event. Focusing on technology, connectivity, and platforms. Intel will have three speakers. For more information, please contact HP's web site.

<http://www.hpworld.org/>

**California Computer Expo**

August 20–23, San Diego, CA

Enhancing the home and office through computer technology, Intel will present a paper on "Home Networking - Unleashing the Power of the Multi-PC Home."

<http://www.computoredge.com/expo/>

**Intel Developer Forum**

September 15–17, Palm Springs, CA

Features 12 graduate level technology training tracks. Over 70 technical sessions will focus on the latest desktop, mobile, server, workstation, and embedded platform technologies with direct access to Intel's top engineers and architects.

<http://developer.intel.com/design/idf>

**Intel Networking Events & Training**

For Intel's events and training programs on networking products and technologies, please visit the Intel networking events page.

<http://www.intel.com/network/events/index.htm>

—End of Platform Solutions Issue 9—